Claims

What is claimed is:

1. In an OFDM-based receiver, means for achieving time synchronization comprising:

   A. means for extracting pilot signals contained in the OFDM received signal;

   B. means for analyzing the pilot signals in the frequency domain and for issuing a signal indicative of a synchronization error in the received signal; and

   C. means for correcting the synchronization error responsive to the signal indicative of the synchronization error.

2. The synchronization means according to claim 1, wherein the means for extracting pilot signals comprise FFT means and signal processing means in the frequency domain.

3. The synchronization means according to claim 1, wherein the means for extracting pilot signals, the means for analyzing the pilot signals and the means for correcting the synchronization error operate continuously in real time to keep the OFDM receiver synchronized.

4. The synchronization means according to claim 1, wherein the means for analyzing the pilot signals in the frequency domain include means for measuring the rate of rotation of the pilot signals.

5. In an OFDM-based receiver, automatic frequency correction means in a subscriber unit comprising:

   A. an inner frequency correction loop for generating a LO frequency related to a frequency of a received signal; and

   B. an outer frequency correction loop for correcting the LO frequency according to instructions received from a base station.

6. The automatic frequency correction means according to claim 5, wherein the inner frequency correction loop includes means for locking to the frequency of the received signal.

7. The automatic frequency correction means according to claim 5, wherein the outer loop includes DDS means for generating a signal at a frequency derived from that of the received signal, modified according to the instructions received from the base station.

8. In an OFDM-based receiver, a channel sounder comprising:

A. means for extracting pilot signals contained in the OFDM received signal;

B. means for analyzing the pilot signals in the frequency domain and for issuing signals indicative of a distortion in each pilot signal, wherein each of said pilot distortion signals comprises both an amplitude and a phase component; and

C. means for analyzing the signals indicative of a distortion in each pilot signal and for computing therefrom corrective signals for correcting distortions in the received signal.

9. The channel sounder according to claim 8, wherein the correction of the received signal is performed in the complex domain, to include both gain and phase corrections.

10. The channel sounder according to claim 8, further including means for computing an average distortion of two adjacent pilots and for using that average to correct the information between these pilots.

11. The channel sounder according to claim 8, further including means for computing, for each frequency between two adjacent pilots, an interpolated value of the distortion, and for using that interpolated value to correct the information at that frequency.

12. The channel sounder according to claim 11, wherein the interpolation is performed in the time domain or the frequency domain.

13. The channel sounder according to claim 11, wherein the interpolation is performed using a low pass filter or a FIR or convolver.

14. In an OFDM-based receiver, a multipath cancellation system comprising:

A. means for extracting pilot signals contained in the OFDM received signal;

B. means for analyzing the pilot signals in the frequency domain for generating signals indicative of multipath reflections; and

C. equalizer means for reducing multipath, wherein the parameters of the equalizer are controlled by the signals indicative of multipath reflections.

15. The multipath cancellation system according to claim 14, wherein the equalizer means comprise a transversal filter.

16. The multipath cancellation system according to claim 14, wherein the analyzing means comprise processing in the frequency domain, followed with an IFFT.